WHAT IS CLAIMED IS:

1. A data reception method for receiving a transmitted transmission signal in which symbols of transmission data are each mapped to any of a plurality of signal levels, the method comprising at the time of initialization:

detecting signal levels from a training pattern corresponding to the symbols, the training pattern being such that the plurality of signal levels of the transmission signal are sent in a known variation pattern;

initializing a model value of each of the plurality of signal levels to be received according to predetermined conditions, and holding the model values;

repeating a process of comparing a currently detected signal level with an existing model value based on the symbols of the training pattern and updating the existing model value to a new model value obtained by increasing or decreasing the existing model value by a predetermined amount, depending on whether the currently detected signal level is greater or smaller than the existing model value; and

setting evaluation levels using the model values updated based on the symbols of the training pattern, the evaluation levels distinguishing and evaluating the plurality of signal levels of the received transmission signal.

2. The data reception method according to claim 1, wherein the model values which are initialized and held according to the predetermined conditions are the first signal levels detected corresponding to the symbols of the training pattern.

3. The data reception method according to claim 1, wherein the model values which are initialized and held according to the predetermined conditions are preset fixed values.

4. The data reception method according to claim 1, wherein the evaluation levels are set by taking an average between any adjacent model values updated based on the symbols of the training pattern.

5. The data reception method according to claim 1, wherein:

as a result of the comparison of the currently detected signal level against the existing model value based on the symbols of the training pattern, if the currently detected signal level is greater than the existing model value, the existing model value is updated to a new model value obtained by adding a predetermined amount to the existing model value; and

if the currently detected signal level is smaller than the existing model value, the existing model value is updated to a new model value obtained by subtracting a predetermined amount

from the existing model value.

6. The data reception method according to claim 5, wherein the predetermined amount is set to a value which is always equal to or smaller than a difference obtained from the comparison.

7. The data reception method according to claim 1, wherein:

as a result of the comparison of the currently detected signal level against the existing model value based on the symbols of the training pattern, if the currently detected signal level is greater than the existing model value, the existing model value is updated to a new model value obtained by adding to the existing model value an amount which is equal to or smaller than the difference and which is weighted according to the difference; and

if the currently detected signal level is smaller than the existing model value, the existing model value is updated to a new model value obtained by subtracting from the existing model value an amount which is equal to or smaller than the difference and which is weighted according to the difference.

8. The data reception method according to claim 5, wherein:

the plurality of signal levels corresponding to the symbols of the training pattern are detected by calculating a

difference in signal level between any of the symbols and a previous symbol; and

the evaluation levels are set for distinguishing and evaluating the plurality of signal levels received, based on a difference in signal level between any of the symbols and a previous symbol.

9. The data reception method according to claim 8, further comprising, after the initialization, outputting results of distinguishing the plurality of signal levels corresponding to the symbols of the transmission signal, by using the evaluation levels.

10. The data reception method according to claim 9, wherein data to be transmitted and received is a signal having a data format defined by MOST (Media Oriented Systems Transport).

11. The data reception method according to claim 1, wherein:

the training pattern is sent with a predetermined header after a lock signal has been sent, the lock signal including a clock component for establishing synchronization with a transmitting end;

the plurality of signal levels are divided into an upper group including relatively high signal levels and a lower group

including relatively low signal levels;

the training pattern and the lock signal are such that any of the signal levels selected from the upper group and any of the signal levels selected from the lower group are mapped alternately; and

the header is such that adjacent symbols are mapped to the same signal level.

12. The data reception method according to claim 11, further comprising at the time of the initialization:

establishing synchronization with the transmitting end by recovering the clock component of the lock signal; and

detecting the header by detecting, among the signal levels after synchronization is established, adjacent signal levels which are identical to each other.

13. The data reception method according to claim 11, wherein:

the training pattern is sent for a predetermined period of time from when the header is sent out; and

the repetition of update of the model values ends when the predetermined period of time from a reception of the header has elapsed.

14. A data reception apparatus connected to a data

transmission apparatus by a transmission path, for receiving a transmitted transmission signal in which symbols of transmission data are each mapped to any of a plurality of signal levels, the data reception apparatus comprising:

a signal level detection section for detecting, at the time of initialization, signal levels from a training pattern corresponding to the symbols, the training pattern being such that the plurality of signal levels of the transmission signal sent from the data transmission apparatus are formed in a known variation pattern;

a model value storage section having a plurality of storage means for storing a model value of each of the plurality of signal levels to be received, the model values initialized according to predetermined conditions, stored in their respective storage means, and updated according to a predetermined process;

a comparison and update section for repeating a process of comparing a currently detected signal level with an existing model value stored in the storage means based on the symbols of the training pattern and updating the existing model value to a new model value obtained by increasing or decreasing the existing model value by a predetermined amount, depending on whether the currently detected signal level is greater or smaller than the existing model value;

an evaluation level value arithmetic section for calculating evaluation levels using the model values updated and

stored in the plurality of storage means, the evaluation levels distinguishing and evaluating the plurality of signal levels of the transmission signal received by the data reception apparatus from the data transmission apparatus; and

an evaluation level storage section for storing the evaluation levels calculated by the evaluation level value arithmetic section.

15. The data reception apparatus according to claim 14, wherein the model values which are initialized and stored in the plurality of storage means according to the predetermined conditions are the first signal levels detected corresponding to the symbols of the training pattern, by the signal level detection section.

16. The data reception apparatus according to claim 14, wherein the model values which are initialized and stored in the plurality of storage means according to the predetermined conditions are preset fixed values.

17. The data reception apparatus according to claim 14, wherein the evaluation level value arithmetic section calculates the evaluation levels by taking an average between any adjacent model values updated and stored in the plurality of storage means.

18. The data reception apparatus according to claim 14, wherein:

if the currently detected signal level is greater than the existing model value, the comparison and update section updates, based on the symbols of the training pattern, the existing model value to a new model value obtained by adding a predetermined amount to the existing model value; and

if the currently detected signal level is smaller than the existing model value , the comparison and update section updates, based on the symbols of the training pattern, the existing model value to a new model value obtained by subtracting a predetermined amount from the existing model value.

19. The data reception apparatus according to claim 18, wherein the comparison and update section adds to or subtracts from the existing model value stored in the storage means the predetermined amount that is set to a value which is always equal to or smaller than a difference obtained from the comparison.

20. The data reception apparatus according to claim 14, wherein:

if the currently detected signal level is greater than the existing model value, the comparison and update section updates, based on the symbols of the training pattern, the existing model

value to a new model value obtained by adding to the existing model value an amount which is equal to or smaller than the difference and which is weighted according to the difference; and

if the currently detected signal level is smaller than the existing model value, the comparison and update section updates, based on the symbols of the training pattern, the existing model value to a new model value obtained by subtracting from the existing model value an amount which is equal to or smaller than the difference and which is weighted according to the difference.

21. The data reception apparatus according to claim 18, wherein:

the signal level detection section detects the plurality of signal levels corresponding to the symbols of the training pattern, by calculating a difference in signal level between any of the symbols and a previous symbol; and

the evaluation levels are set for distinguishing and evaluating the plurality of signal levels received by the data reception apparatus from the data transmission apparatus, based on a difference in signal level between any of the symbols and a previous symbol.

22. The data reception apparatus according to claim 21, wherein the signal level detection section further outputs, when the transmission signal is received through the mapping by

the data reception apparatus from the data transmission apparatus, results of distinguishing and evaluating the plurality of signal levels sent from the data transmission apparatus, using the evaluation levels stored in the evaluation level storage section.

23. The data reception apparatus according to claim 22, wherein data to be transmitted and received is a signal having a data format defined by MOST (Media Oriented Systems Transport).

24. The data reception apparatus according to claim 14, wherein:

the training pattern is sent with a predetermined header from the data transmission apparatus after a lock signal has been sent, the lock signal including a clock component for establishing synchronization with the data transmission apparatus;

the plurality of signal levels are divided into an upper group including relatively high signal levels and a lower group including relatively low signal levels;

the training pattern and the lock signal are such that any of the signal levels selected from the upper group and any of the signal levels selected from the lower group are mapped alternately; and

the header is such that adjacent symbols are mapped to the same signal level.

25. The data reception apparatus according to claim 24, further comprising:

a conversion section for converting the transmission signal received into a digital signal;

a filter for shaping a waveform by removing noise from the digital signal converted in the conversion section;

a clock recovery section for establishing synchronization with the data transmission apparatus by recovering the clock component of the lock signal converted into a digital signal in the conversion section; and

a reverse mapping section,

wherein:

the signal level detection section further outputs, in accordance with clocks whose synchronization is established by the clock recovery section, results of distinguishing and evaluating a plurality of signal levels of the digital signal using the evaluation levels stored in the evaluation level storage section; and

the reverse mapping section decodes the symbols of received data which is sent as the transmission signal, by performing a reverse mapping on the evaluation results outputted by the signal level detection section.

26. The data reception apparatus according to claim 25, further comprising:

a header detection section for detecting, at the time of the initialization, the header by detecting, among the signal levels of the digital signal after synchronization is established by the clock recovery section, adjacent signal levels which are identical to each other; and

a teacher signal generation section for outputting a teacher signal to the comparison and update section based on timing at which the header is detected by the header detection section and clock timing at which synchronization is established by the clock recovery section, the teacher signal designating any of the storage means to be updated by the comparison and update section.

27. The data reception apparatus according to claim 26, further comprising a counter, wherein:

the training pattern is sent for a predetermined period of time from when the header is sent out;

the counter counts the predetermined period of time; and

the comparison and update section detects the end of the training pattern based on counts by the counter and stops updating the model values stored in the storage means.

28. The data reception apparatus according to claim 27, wherein the reverse mapping section performs, after the training pattern has been received, a reverse mapping on the

evaluation results outputted from the signal level detection section and starts decoding the symbols of the received data.

29. A data transmission system having a plurality of data transmission apparatuses connected to each other in a ring by transmission paths, the data transmission apparatuses communicating with each other in one direction, wherein the data transmission apparatuses each comprise:

a data transmitting section for mapping symbols of transmission data to any of a plurality of signal levels and sending a mapped electrical signal to any of the data transmission apparatuses of a subsequent data transmission apparatus;

a training pattern transmitting section for sending, at the time of initialization, a training pattern to the subsequent data transmission apparatus, the training pattern being such that the plurality of signal levels of the electrical signal are formed in a known variation pattern;

a signal level detection section for detecting signal levels from the electrical signal sent from any of the data transmission apparatuses of a previous data transmission apparatus, corresponding to the symbols, and distinguishing and evaluating the detected signal levels upon data reception;

a model value storage section having a plurality of storage means for storing, at the time of the initialization, a model value of each of the plurality of signal levels to be received,

the model values initialized according to predetermined conditions, stored in their respective storage means, and updated according to a predetermined process;

a comparison and update section for repeating a process of comparing a currently detected signal level with an existing model value stored in the storage means based on the symbols of the training pattern and updating the existing model value to a new model value obtained by increasing or decreasing the existing model value by a predetermined amount, depending on whether the currently detected signal level is greater or smaller than the existing model value;

an evaluation level value arithmetic section for calculating evaluation levels using the model values updated and stored in the plurality of storage means, the evaluation levels being used by the signal level detection section for distinguishing and evaluating the plurality of signal levels of the electrical signal upon data reception; and

an evaluation level storage section for storing the evaluation levels calculated by the evaluation level value arithmetic section.

30. The data transmission system according to claim 29, wherein the model values which are initialized and stored in the plurality of storage means according to the predetermined conditions are the first signal levels detected corresponding to

the symbols of the training pattern, by the signal level detection section.

31. The data transmission system according to claim 29, wherein the model values which are initialized and stored in the plurality of storage means according to the predetermined conditions are preset fixed values.

32. The data transmission system according to claim 29, wherein the evaluation level value arithmetic section calculates the evaluation levels by taking an average between any adjacent model values updated and stored in the plurality of storage means.

33. The data transmission system according to claim 29, wherein:

if the currently detected signal level is greater than the existing model value, the comparison and update section updates, based on the symbols of the training pattern, the existing model value to a new model value obtained by adding a predetermined amount to the existing model value; and

if the currently detected signal level is smaller than the existing model value, the comparison and update section updates, based on the symbols of the training pattern, the existing model value to a new model value obtained by subtracting a

predetermined amount from the existing model value.

34. The data transmission system according to claim 33, wherein the comparison and update section adds to or subtracts from the existing model value the predetermined amount that is set to a value which is always equal to or smaller than a difference obtained from the comparison.

35. The data transmission system according to claim 29, wherein:

if the currently detected signal level is greater than the existing model value, the comparison and update section updates, based on the symbols of the training pattern, the existing model value to a new model value obtained by adding to the existing model value an amount which is equal to or smaller than the difference and which is weighted according to the difference; and

if the currently detected signal level is smaller than the existing model value, the comparison and update section updates, based on the symbols of the training pattern, the existing model value to a new model value obtained by subtracting from the existing model value an amount which is equal to or smaller than the difference and which is weighted according to the difference.

36. The data transmission system according to claim 33, wherein:

the signal level detection section detects the plurality of signal levels by calculating a difference in signal level between any of the symbols and a previous symbol; and

the evaluation levels are set for distinguishing and evaluating the plurality of signal levels corresponding to the symbols of the transmission signal sent from the previous data transmission apparatus upon data reception, based on a difference in signal level between any of the symbols and a previous symbol.

37. The data transmission system according to claim 36, wherein the signal level detection section outputs, upon the data reception, evaluation results using the evaluation levels stored in the evaluation level storage section.

38. The data transmission system according to claim 37, wherein data to be transmitted and received is a signal having a data format defined by MOST (Media Oriented Systems Transport).

39. The data transmission system according to claim 29, wherein:

the training pattern is sent with a predetermined header from the previous data transmission apparatus after a lock signal has been sent, the lock signal including a clock component for establishing synchronization with the previous data transmission apparatus;

the plurality of signal levels are divided into an upper group including relatively high signal levels and a lower group including relatively low signal levels;

the training pattern and the lock signal are such that any of the signal levels selected from the upper group and any of the signal levels selected from the lower group are mapped alternately; and

the header is such that adjacent symbols are mapped to the same signal level.

40. The data transmission system according to claim 39, wherein the data transmission apparatuses each further comprises:

a conversion section for converting the electrical signal received into a digital signal;

a filter for shaping a waveform by removing noise from the digital signal converted in the conversion section;

a clock recovery section for establishing synchronization with the previous data transmission apparatus by recovering the clock component of the lock signal; and

a reverse mapping section,

wherein:

the signal level detection section further outputs, in accordance with clocks whose synchronization is established by the clock recovery section, results of distinguishing and

evaluating a plurality of signal levels of the digital signal using the evaluation levels stored in the evaluation level storage section; and

the reverse mapping section decodes the symbols of received data which is sent as the electrical signal, by performing a reverse mapping on the evaluation results outputted by the signal level detection section.

41. The data transmission system according to claim 40, wherein the data transmission apparatuses each further comprises:

a header detection section for detecting, at the time of the initialization, the header by detecting, among the signal levels of the digital signal after synchronization is established by the clock recovery section, adjacent signal levels which are identical to each other; and

a teacher signal generation section for outputting a teacher signal to the comparison and update section based on timing at which the header is detected by the header detection section and clock timing at which synchronization is established by the clock recovery section, the teacher signal designating any of the storage means to be updated by the comparison and update section.

42. The data transmission system according to claim 41, wherein the data transmission apparatuses each further

comprises a counter, wherein:

the training pattern is sent for a predetermined period of time from when the header is sent out;

the counter counts the predetermined period of time; and

the comparison and update section detects the end of the training pattern based on counts by the counter and stops updating the model values stored in the storage means.

43. The data transmission system according to claim 42, wherein the reverse mapping section performs, after the training pattern has been received, a reverse mapping on the evaluation results outputted from the signal level detection section and starts decoding the symbols of the received data.